

Serial No. 10/647,057

Docket No. 30296A-DIV1

**Listing of Claims:**

1-3. (Canceled)

4. (Currently amended) ~~The An isolated nucleic acid sequence of claim 1, said~~  
~~that comprises a nucleotide sequence having comprising~~ at least about 87% sequence homology with  
~~a the nucleotide sequence selected from the group consisting of SEQ ID NO: 8, Nos. 8-14 SEQ ID~~  
~~NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and~~  
~~combinations thereof; wherein said nucleotide sequence encodes a polypeptide that induces anti-~~  
~~leukotoxin antibodies in a mammal, when administered to said mammal.~~

5-8. (Canceled)

9. (Currently amended) ~~The An expression vector that comprises the isolated~~  
~~nucleic acid of claim 4 6, said nucleotide sequence having at least about 87% sequence homology~~  
~~with a sequence selected from the group consisting of Nos. 8-14.~~

10. (Canceled)

11. (Currently Amended) ~~A An isolated variant nucleic acid nucleotide sequence~~  
which differs from that ~~the isolated nucleic acid~~ of claim 4 ~~1;~~ due to a mutation event selected from  
the group consisting of a point ~~mutation mutations, a deletion deletions, an insertion insertions, and~~  
~~a rearrangement; rearrangements wherein said variant nucleic acid comprises at least 87% sequence~~  
~~homology with at least 1,017 contiguous nucleotides of the nucleotide sequence of SEQ ID NO: 8;~~  
~~and wherein said variant nucleic acid encodes a polypeptide that induces anti-leukotoxin antibodies~~  
~~in a mammal, when administered to said mammal.~~

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12. (Withdrawn) A vaccine effective for conferring protective immunity against *F. necrophorum* comprising the protein expressed by a portion of SEQ ID No. 8 and a suitable pharmacologically compatible carrier.

13. (Withdrawn) The vaccine of claim 12, said vaccine being prepared by a method comprising the steps of:

- a) providing the *F. necrophorum* gene which expresses leukotoxin;
- b) truncating said *F. necrophorum* gene into a plurality of discrete nucleotide sequences, each of said discrete nucleotide sequences encoding for a respective polypeptide sequence;
- c) expressing and recovering said encoded polypeptide sequence expressed by at least one of said discrete nucleotide sequences;
- d) inactivating said recovered polypeptide sequence; and
- e) combining said inactivated polypeptide sequence with said suitable pharmacologically compatible carrier to produce said vaccine.

14. (Withdrawn) The vaccine of claim 13, said discrete nucleotide sequences having a sequence having at least about 50% sequence homology with a sequence selected from the group consisting of SEQ ID Nos. 9-14.

15. (Withdrawn) The vaccine of claim 13, further comprising the step of expressing and recovering said respective polypeptides using said nucleotide.

16. (Canceled)

17. (Currently amended) ~~The A recombinant nucleic acid sequence of claim 1,~~  
~~said that comprises a nucleotide sequence having comprising~~ at least about 87% sequence homology  
with a the nucleotide sequence selected from the group consisting of SEQ ID ~~NO: 8, Nos. 8-14~~ SEQ

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ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and combinations thereof; wherein said nucleotide sequence encodes a polypeptide that when administered to a mouse confers effective protective immunity against *F. necrophorum* in said mouse.

18-19. (Canceled)

20. (New) An isolated nucleic acid encoding a polypeptide that comprises an amino acid sequence comprising at least 339 contiguous amino acids from SEQ ID NO: 1; wherein, when said polypeptide is administered to a mammal, anti-leukotoxin antibodies are induced in said mammal.

21. (New) The isolated nucleic acid of claim 20; wherein said polypeptide is recognized by anti-native leukotoxin antibodies.

22. (New) The isolated nucleic acid of claim 20; wherein antisera comprising the anti-leukotoxin antibodies induced in said mammal recognize native leukotoxin.

23. (New) The isolated nucleic acid of claim 20; wherein antisera comprising the anti-leukotoxin antibodies induced in said mammal neutralize the activity of native leukotoxin towards polymorphonuclear leukocytes in an *in vitro* assay.

24. (New) The isolated nucleic acid of claim 20; wherein said nucleic acid ranges in size from 1.1 kilobases to 2.8 kilobases.

25. (New) The isolated nucleic acid of claim 20; wherein said polypeptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, and combinations thereof.

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26. (New) An expression vector that comprises the isolated nucleic acid of claim 20.

27. (New) An expression vector that comprises the isolated nucleic acid of claim 25.

28. (New) A recombinant nucleic acid that comprises a portion of SEQ ID NO: 8 and encodes a polypeptide that comprises an amino acid sequence comprising at least 339 contiguous amino acids from SEQ ID NO: 1; wherein when said polypeptide is administered to a mouse it confers effective protective immunity against *F. necrophorum* in said mouse.

29. (New) A variant nucleic acid which differs from the isolated nucleic acid of claim 20 due to a mutation event selected from the group consisting of a point mutation, a deletion, an insertion, and a rearrangement; wherein said variant nucleic acid comprises at least 87% sequence homology with at least 1,017 contiguous nucleotides of the nucleotide sequence of SEQ ID NO: 8; and wherein said variant nucleic acid encodes a polypeptide that induces anti-leukotoxin antibodies in a mammal, when administered to said mammal.